THE AUSTRALIAN PLANT DISEASE RECORDER.

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PLANT DISEASE NOTES.

CEREALS AND GRASSES:

UNUSUAL FROST INJURY TO WHEAT:

Certain unusual symptoms of frost injury to wheat were noted in the Tamworth district in October.

In some crops up to 50% of the ear-bearing stalks had toppled over and were hanging downwards to make an angle of about 20° with the upright stem portions. The break occurred at a point varying from 2 to 5 inches below the basal florets of the head. A considerable number of heads and attached stalk portions had snapped off completely. The condition was most apparent in natural depressions and in pockets created by plants which had lodged previously in wet, windy weather.

Examination revealed that prior frost injury in the form of a "ring-barking" of the ear-bearing stalk was primarily responsible for the trouble. Severe winds, which accompanied a storm on October 15th, completed the damage.

The condition was most apparent in Kendee and other broad-flagged varieties. This suggests the possibility that water droplets, held in close contact with the ear-bearing stalks by the heavy flag, induced a slow-freeze frosting of the tissues which manifested itself as a "ring-bark" condition. Ear emergence differences would explain why a certain percentage of, and not all, the heads were affected.

Another unusual condition present in the Tamworth district and reported from other districts in northern and central western N.S.W. has been termed "goose-neck". It is characterised by a gradual bending over of the ear-bearing stalk in a loop-like fashion. Ultimately the head points downwards but no complete break occurs in the stalk tissues and affected ears ripen more or less normally. Observations indicate that this is due to a partial "ring-barking" effect. Frost-damaged tissue is invariably found on the inside of the "loop". On the outermost stalk regions the tissues are normal. This suggests that an unequal growth rate is responsible for the gradual development of a bend in the stalk. Frosted tissue coincides with that portion of the stalk adjacent to the flag, and lends support to the moisture-retention, slow-freeze, "ring-bark" theory.

- F.C. BUTLER.

ANTHRACNOSE OF BROMUS UNIOLOIDES:

Colletotrichum graminicolum has been recorded in N.S.W. on wheat but does not appear to be a parasite of much economic importance. During late winter and early spring this year it has developed in epiphytotic proportions on Bromus unioloides in the Carlingford district (Metropolitan area). No such development took place in other grasses growing in the vicinity. In particular, B. gussonii and B. molliformis, though very heavily infected with rust and powdery mildew, respectively, were quite free of anthracnose. Weather conditions during winter were unusually wet and very favourable for leaf spot-causing pathogens generally.

- L. R. FRASER.

OVERWINTERING OF ERGOT OF PASPALUM:

In Brisbane, Paspalum dilatatum is rarely seen in head during the winter period from June to the end of August. On 1st August, Paspalum dilatatum, in flower, was observed in a sheltered position on the north-east corner of a building on the bank of the Brisbane River just outside the University grounds. A leaking fire hydrant nearby had kept the ground moist. Numerous florets on a number of inflorescences were ergotised, and large amounts of honey-dew had been exuded. A search nearby revealed a number of dead inflorescences which had dried-up honey-dew on them. Apparently a few inflorescences have been produced by the paspalum during the winter and the ergot has persisted in the sphacelial state.

On 4th August, at Kuraby, a few miles south of Brisbane, Paspalum orbiculare was observed with a fresh sphacelial stage on a young inflorescence. The plant was growing in wet soil on the edge of a tea-tree swamp.

The overwintering of ergot in the sphacelial stage on species of Paspalum means that rapid spread of the disease may take place as soon as the bulk of the hosts flower again.

- R. F. LANGDON.

FIELD AND FODDER CROPS:

YELLOW BEAN MOSAIC ON SUB. CLOVER:

Two subterranean clover (*Trifolium subterraneum*) plants showing symptoms of a virus attack similar to that described by McWhorter and Hardison (Pl. Dis. Rptr. 33: 2: 86-88, 1949) were recently received from Tenterfield, N.S.W. The plants, which were noticeably stunted, showed a distinctive leaf mottle condition with extensive puckering of individual leaflets. The new growth was yellowish and somewhat spindly.

Sap from infected leaves was used to inoculate French bean (*Phaseolus vulgaris*). Typical symptoms of yellow bean mosaic developed. This represents the first definite record of this virus disease on a species of *Trifolium* in N.S.W., Stubbs (A.P.D.R. 1: 2: 19-21, 1949) has recorded the disease on *T. subterraneum* and *T. incarnatum* in Victoria. As a result, sub. clover and other clovers known to harbour the disease and its insect vectors may prove to be important sources of infection by yellow bean mosaic in this State.

- F. C. BUTLER.

RUST OF BURR MEDIC:

A rust of burr medic (*Medicago denticulata*) was collected near the University, Brisbane, in September, 1949. Only uredospores were found. This appears to be the first record of rust on this plant in Queensland.

- R. F. LANGDON.

RUST OF WHITE CLOVER:

An outbreak of rust (*Uromyces trifolii-repentis*) on white clover (*Trifolium repens*) was observed early in September 1949 in the Domain, Brisbane. A good stand of clover among *Paspalum dilatatum* showed irregular brown patches. The plants in these areas were heavily infected with rust. All spore types could be found. Heavily infected leaves were dead, and premature death of floral parts occurred where peduncles were abundantly infected.

- R. F. LANGDON.

VEGETABLES:

INJURY TO TOMATO SEEDLINGS FOLLOWING SOIL FUMIGATION WITH CHLOROPICRIN:

A case of injury to tomato seedlings occurring on soil which had been fumigated for the control of the root knot nematode (*Heterodera marioni*) was noted on 20/9/49 at the Biological Branch Experiment Plot, Botanic Gardens, Sydney.

The injury took the form of a "burning" and shrivelling of the stem at, and below, ground level, causing the plants to collapse; 40% of the plants on the fumigated plot were affected.

The fumigant "Larvacide" (99% chloropicrin) had been applied to the soil on 1/9/49 at the rate of 42 gallons per acre - application was as space injections in "staggered" holes 10 inches apart, in rows the same distance apart. 3 c.c. of the fumigant were used in each hole, which was 6 inches deep.

For the two weeks between fumigation and planting out of the seedlings (variety Break o' Day) on 15/9/49, the weather was almost continuously wet and overcast, 1.33 inches of rain being recorded, but the 5 days between planting and observation of the condition were warm and dry.

Some of the fumes of the chloropicrin had apparently been retained in the wet soil and the dry days following planting had resulted in the release of these fumes bringing about injury to the plants.

- R. J. CONROY.

"PIMPLE POD" OF PEAS:

Investigations are being conducted on a condition of peas characterised by raised pimples and distortion of the pods; vein clearing and yellow spots, frequently with necrotic centres, on the leaves; and general dwarfing of the affected plants. The leaves of affected plants often show severe crinkling and puckering. An unusual symptom consists of brownish, water-soaked areas, sometimes raised into blistered areas, on the peas themselves. When the peas are cooked, the brown discolouration is intensified and renders affected peas unsuitable for canning. When the peas dry out for seed the affected peas show brownish areas on the seed coat.

The disease is only important on the "Canner's Perfection" variety, and no infection has been detected on the "Greenfeast" variety, though some little-grown varieties such as "Surprise" and "Major" sometimes show infection.

The disease has been shown to be due to a virus which is transmitted by Myzus persicae and Mactosiphum gei. Mechanical transmission has not been demonstrated in spite of repeated trials, including the use of an abrasive and a buffer solution, with or without sodium sulphite. Seed transmission has not been demonstrated even with seeds showing obvious symptoms on the seed coat. However, the work on this aspect has been on a small scale and is being continued. It has not been found possible to establish grafts between infected and healthy plants, using techniques that are effective between material from healthy plants.

The virus is persistent in the vector, and there is a delay of approximately 24 hours in development of infectivity. The percentage of transmission obtained is increased with increase in the duration of the feeding period on the infected plant.

The host range of the virus has not yet been determined.

- G. C. WADE.

FRUIT:

TOP ROT OF PINEAPPLE (Phytophthora cinnamomi):

Top rot of the pineapple plant has been known in Queensland for some years and has now been recorded in New South Wales. A specimen of rotting heart leaves of a pineapple plant was received from Bangalow in September and the top rot pathogen, Phytophthora cinnamomi, has been isolated from the rotting tissues. This fungus is believed to be also the cause of pineapple wilt in this State but has not yet been isolated here from pineapple roots.

- C. J. MAGEE.

ROOT ROT OF PEACH TREES:

Some 20,000 to 25,000 peach trees died in a nursery at Carlingford, in the Sydney Metropolitan Area, following heavy rains in January, 1949. *Phytophthora cinnamomi* was isolated from the roots of these trees.

The drainage of the site where the trees died was exceedingly bad. The land (heavy clay loam soil) sloped fairly steeply, and in the centre of the block where the greatest mortality occurred, the subsoil came close to the surface, with consequent elevation of drainage water relative to the soil surface. Following the January rains, this section was completely water-logged for a considerable period but, wherever the drainage was reasonably good, the trees remained healthy.

It is proposed to test the reaction of peach seedlings to water-logging under controlled conditions, with and without *Phytophthora cinnamomi*.

- K. E. HUTTON.

BROWN ROT OF APRICOTS:

In the course of investigational work on this disease, a search was made for apothecia of the fungus. They were first found on August 12th in a property at Cambridge. Since their first discovery, the property has been visited frequently, and apothecia have been found at each visit up to the present time (13/9/49). Apart from Cambridge they have also been detected on properties at Austin's Ferry and Blackman's Bay, but at no time have they been abundant, even in cases where mummified fruit were very plentiful.

The apothecia were produced from the underside of "mummies" resting on the surface of the ground, or from "mummies" up to one inch below the surface. They were not found developing from "mummies" buried more deeply than one inch.

Two properties which suffered severely from brown rot last season were inspected. The properties had been neglected, and no cultivations or collection of "mummies" had been carried out, and yet no apothecia were found in a careful search. In both cases sheep had been grazed under the trees, and there was evidence that the "mummies" had been eaten by the stock, and that possibly explained the absence of apothecia.

The weather has been extremely dry, and there has been very little blossom infection with brown rot this season, even in unsprayed properties.

- G. C. WADE.

ORNAMENTALS:

A DISEASE OF AFRICAN MARIGOLD (TAGETES ERECTA) CAUSED BY A STRAIN OF THE TOBACCO MOSAIC VIRUS:

During a visit to tobacco growing areas of north-eastern Victoria in February, 1949, the writer was asked to identify a disease affecting a seed crop of African marigold at Gapsted.

A very high proportion of the plants in the crop was affected. Some plants were affected more severely than others, and about 10% had died, or were wilting badly at the time of inspection. Diseased plants had a bunchy appearance due to shortening of the internodes, the leaves were small and somewhat distorted and dark necrotic streaks occurred on the lower stem regions. The flowers on affected plants were normal in colour and appearance, but small in size.

Sap inoculations made at Burnley from diseased material produced typical symptoms of the tobacco mosaic virus disease on tobacco, tomato and Nicotiana glutinosa, and inoculations with sap from artificially infected tobacco reproduced the disease on African marigold.

Artificially infected tomatoes grown under greenhouse conditions during the autumn developed very severe "fern leaf" symptoms with complete suppression of the laminae of the topmost leaves. It is possible, therefore, that the distorting or enation strain of the tobacco mosaic virus (Nicotiana virus 1 of Smith) was the cause of the African marigold disease.

It is suggested that disbudding, to encourage the plants to proliferate, was responsible for the entry and spread of the virus in the crop. A tobacco crop containing some mosaic infected plants was growing, nearby, on the same property.

- L. L. STUBBS.

MISCELLANEOUS PLANTS:

DIEBACK OF *Pinus ponderosa* IN A.C.T.:

During 1948 and early 1949, it was noticed that numerous trees of western yellow pine (*Pinus ponderosa*) in plantations near Canberra had developed severe dieback, originating either at the apex or (less frequently) on laterals. The present extent of dieback varies from the uppermost few inches of the leader to (in a few instances) the whole tree; usually about the top quarter is dead.

As far as the writers know, the trouble is almost entirely confined to four compartments of *P. ponderosa*. Two of these, on steep rocky hillsides near the Cotter Dam, were planted in 1928 and 1930 respectively. The 1930 block is considered by foresters to be probably the best *P. ponderosa* in A.C.T., apart from the dieback. A third compartment, planted in 1929, is on gently undulating ground near the foot of Mt. Stromlo, and a fourth, planted in 1939 on flat and rather poorly drained land at Uriarra, is affected to a lesser degree than the others. *P. radiata* and *P. laricio* adjacent to one or more of the affected areas, and on similar soil, are free or almost free from dieback. Several other compartments of *P. ponderosa* in A.C.T. plantations, all planted after 1930, are free from dieback as yet.

Probably at least five per cent. of trees in affected areas are suffering from dieback. In a brief survey, the distribution of affected trees could not be correlated with localized features of the environment. They occurred on the driest and the moistest parts of affected areas, along edges of firebreaks as well as within compartments, on stony ridges and on the deeper soils near creek beds. The trees have not yet formed a canopy, and there is little if any accumulation of organic matter from the decay of needles on the soil.

Pycnidia of *Diplodia pinea* occur on the affected trees, especially on the outer surface of the lower scales of dead cones, and on partially rotted dead branches on the ground. They also occur in a similar way on *P. radiata* and *P. laricio* unaffected by dieback. On splitting affected leaders longitudinally, localized blue stains were found in the dead wood, apparently originating at the junctions of laterals with the main axis. Platings of blue-stained wood consistently gave rise to a fungus which has not yet fruited in pure culture, but which appears identical with *D. pinea* in cultural characters. Dead but unstained wood was sterile. There was no evidence of insect injury in the aerial portions; the butts and roots have not yet been examined.

In view of previous experience with the same host and fungus in A.C.T. (Ludbrook, W.V. and White, N.H., J. Coun. Sci. Ind. Res. 13: 191-194, 1940), and the opinion of a majority of the other authors cited in the above paper, it is thought unlikely that D. pinea is the primary cause of the trouble. Probably some undetermined environmental factor is responsible. Wagener (J. Forestry 47 : 49-53. 1949) attributes dieback of P. coulteri in California to freezing injury from a sudden cold snap after mild weather; extensive Diplodia infection and dieback often follow hail injury; but there is no evidence that either of these is concerned in the dieback under discussion.

Groups of P. ponderosa near the Forestry School, Canberra, have suffered from varying degrees of dieback during the past fifteen years or more; most of these have recovered and now appear healthy. The writers would be interested to hear of any other large-scale occurrences of dieback of P. ponderosa in Australian pine plantations.

- W.V. LUDBROOK AND
C. E. CARTER.

APPARENT FUSION OF SPORIDIA IN USTILAGO UTRICULOSA:

Germination studies by Mr. K. Maxwell, 4th Year Agriculture Student at Sydney University, have shown that there is apparent fusion of sporidia in Ustilago utriculosa from a species of Polygonum, which, as yet, has not been identified.

Spores taken from fresh material produced the triseptate promycelia and lateral sporidia after two days in water. Budding occurred, as mentioned by McAlpine (The Smuts of Australia, p.162), but connections quite dissimilar from budding were also observed between some sporidia. No further development after the apparent fusing was noted.

- D. SHAW.

SEPTORIA LEAF SPOT OF *ERODIUM CYGNORUM*:

Leaf spots on *Erodium cygnorum* (specimens collected by Drs. I.A. Watson and E.P. Baker at Singleton), were found to be caused by a species of *Septoria*. No species of *Septoria* is recorded on any *Erodium* spp. by Saccardo, Oudemans or Grove.

Inoculation tests to date have shown *E. moschatum* to be immune. Any specimens of Septoria spots on species of *Erodium* or related genera would be appreciated.

- D. SHAW.

ANTHRACNOSE OF BATHURST BURR:

A disease of Bathurst burr (*Xanthium spinosum*) with symptoms similar to those described by Butler (A.P.D.R. 1:3: 41-42: 1949) was recorded in Queensland in 1941. It was first seen near Toowoomba and has since been found in many localities in the Darling Downs, South Burnett and Lockyer districts. A *Colletotrichum* was isolated and the symptoms reproduced but the study was taken no further.

In a few instances it was evident that the fungus was responsible for the death of a good proportion of burr plants before seeding but more often it appeared late in the season after viable seed had been formed. The disease was not positively identified on Noogoora burr (*Xanthium pungens*) and observations indicate that this species which is the more serious pest in these districts has at least an unfortunate degree of resistance.

- R. B. MORWOOD.

MISCELLANEOUS AND GENERAL NOTES:

EELWORM IN VIRGIN SOIL:

White (A.P.D.R. 1:3:39. 1949) has recorded a severe infestation of eelworm, probably *Heterodera marioni*, from late crops of beans and tomatoes grown on virgin soil at Pennant Hills, and noted the presence of symptoms on roots of native plants in the area. In a rain forest clearing in the mountains behind Dayboro (Queensland) over a mile from the nearest habitation, the roots of a native raspberry, *Rubus rosaefolius*, have been found moderately infested with what is presumably the same eelworm. Though the eelworm may possibly have arrived on birds' feet or the wheels of a vehicle from some cultivated area, it was certainly not a legacy from cultivated plants on the spot or within the radius of at least a mile.

- D. A. HERBERT.

COMMONWEALTH MYCOLOGICAL INSTITUTE NOTES.

SOME OF THE SERVICES AND FACILITIES OF C.M.I.:

1. Publishes "Review of Applied Mycology."

2. Issues "Distribution Maps of Plant Diseases."

3. Conducts an Identification Service. The herbarium now consists of some 30,000 collections disposed in about 5,000 species folders.

4. Maintains a National Type Culture collection of fungi of phytopathological importance and those taxonomically of interest to plant pathologists. Moulds for test purposes in proofing of fabrics, leather, etc., are also kept. Cultures of wood-rotting fungi are maintained at the Forest Products Laboratory, Princes Risborough.

5. Provides an Information Service on plant diseases.

6. Publishes an Index of Fungi (formerly named Supplements to the R.A.M.) listing new species of fungi, new combinations and new names.

7. Issues from time to time the valuable series - "Mycological Papers".

8. Has instituted a microfilm service and library. Microfilms are available, at moderate cost, of the mycological classics and other publications now out of print.

9. Maintains a library of mycological and phytopathological publications and of translations of important foreign papers. These are available on loan or in microfilm.

10. Conducts research work - vide "Mycological Papers", "A Dictionary of the Fungi", "An Introduction to the Taxonomy and Nomenclature of Fungi", etc., and has close liaison with the Royal Botanic Gardens, Kew, and its unrivalled herbarium and library.

THE HOUSING OF C.M.I.

A problem which has been confronting C.M.I. for some time is a desperate shortage of accommodation and a lack of funds to purchase a new site and carry out extensions. The present building, near one of the entrances to Kew Gardens, was built for the Institute by the Empire Marketing Board in 1930. No additions or extensions have since been made. The 1946 C.A.B. Review Conference recommended that, in view of the great value of the work being undertaken by the Institute, extensions to double the present accommodation be undertaken at an early date. Close consideration has been given since by Dr. Wiltshire to a site for the extensions and it seems that the most suitable place available would be on the opposite side of Ferry Lane. The financing of this site and the building, which, together, might cost £35,000, or more, has yet to be arranged.

COMMONWEALTH AGRICULTURAL BUREAUX CONFERENCE.

There is a proposal that the next C.A.B. Review Conference be held in London in June, 1950. The last conference of this type was held in June, 1946, and its Proceedings were published in November, 1946.

- C. J. MAGEE.